

## Potential waterfowl nesting cover enhancement and maintenance at the Thermalito Afterbay

### 1.0 Description of Potential Resource Action:

This Resource Action involves annual maintenance and development of a total of 200 acres of waterfowl nesting cover within the Thermalito Afterbay portion of the Oroville Wildlife Area (OWA) on an annual rotational basis. Approximately 60 acres would be disked, seeded, and fertilized annually while the remaining 180 acres of previously treated nest cover enhancements would be fertilized to maintain stand density annually. Disking and seeding would occur in the fall after the first fall rains, while fertilization would occur in the early spring.

### 1.1 Background

The Thermalito Afterbay receives significant waterfowl use year-round. Both marginal wetlands and adjacent upland cover are utilized by mallards for nesting cover. Nesting mallards require dense, green, tall, vegetation for nesting within 3/4 miles of brood water. These characteristics are generally lacking within the upland habitats surrounding the Afterbay. However, low nest densities (0.16 nests/acre) do occur within these upland habitats (SP-T1 Interim Report). Lack of adequate cover within upland habitats leads to increased predation rates of mallard nests (Dr. Anthrop pers. comm.). Suitable nesting habitat characteristics are present within the 900 acre wetland margin of the Afterbay. Higher nest densities (0.28 nests/acre) are present within this habitat (SP-T1 Interim Report). However, waterfowl nests within the Afterbay wetland margin are subject to inundation due to project operations.



The California Department of Water Resources (DWR), California Department of Fish and Game (DFG), California Waterfowl Association (CWA) and other stakeholders have worked cooperatively to enhance waterfowl production at the Afterbay over the last 15 years. Extensive experimentation, habitat improvement, and monitoring have occurred. Data analyses indicate that upland cover enhancement involving disk, seeding, and fertilization;

Figure 1.1.1 Mallard nest in dense vetch cover

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- Can increase waterfowl nesting densities to about 10 nests/acre
- May reduce nest predation
- Can maintain adequate cover for 3 to 4 years with annual fertilization
- Can in combination with spring water level control, reduce or eliminate nest losses along the wetland margin
- Cost about \$140-\$160/acre for initial planting and \$28-\$30/acre for subsequent fertilization (Dr. Anthrop pers. communication)

## **2.0 Nexus to Project:**

Water level fluctuations on the Thermalito Afterbay related to hydropower generation can adversely affect nesting waterfowl under certain conditions. Physical topography of the Thermalito Afterbay is such that even relatively minor increases in the water surface elevation can result in flooding of waterfowl nests along the 900 acre wetland margin.

## **3.0 Potential Environmental Benefits:**

Waterfowl nesting cover enhancement can increase nesting densities from 0.16 nests/acre up to 10 nests/acre and reduce nest losses due to project operation if developed in coordination with water level control of the Afterbay during the primary waterfowl nesting season. Further, these waterfowl nesting cover enhancements may serve to reduce predation.

Waterfowl nest cover plots provide cover and/or forage for a variety of wildlife species including reptiles, amphibians, small mammals, and other species of birds. Several special status species forage or nest within these cover enhancements including northern harrier, white-tailed kite, short-eared owl, American bittern, prairie falcon, and Cooper's hawk. The waterfowl nest enhancements provide both plant species and structural diversity to the upland habitats, increasing habitat diversity and ultimately wildlife species diversity.

## **4.0 Potential Constraints**

Several potential constraints serve to limit the amount of waterfowl nest cover which is practicable to produce at the Thermalito Afterbay including;

- presence of vernal pools, swales and other jurisdictional wetlands
- presence of cultural resources
- presence of rare plant populations
- need to avoid areas of high recreation use
- treatment areas need to be dry enough to allow equipment access for fall disking and planting or spring fertilization
- need to locate waterfowl nest cover enhancements as close as possible to waterfowl brood ponds/habitat
- areas needed for other DFG wildlife habitat improvements (wintering waterfowl forage plots)

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### **5.0 Existing Conditions in the Proposed Resource Action Implementation Area:**

The areas most suitable for waterfowl nesting cover enhancement are those upland areas around the Afterbay where food or nest cover plantings have occurred historically as they generally meet all of the design considerations listed below.

Conditions in these areas where food and cover plantings have historically occurred are slightly different than adjacent undisturbed areas. These areas tend to be in more upland situations where seasonal equipment access is possible. Historic disking has resulted in a general leveling of the physical micro topography and improved drainage. Past disturbance (disking, planting, fertilization) related to food and cover enhancement has led to reduced native plant species diversity in these areas. No special status plant species have been identified in the upland habitat around the Thermalito Afterbay. However, a CNPS list 2 plant is common within the wetland margin. Relicensing stakeholders have identified the need to maintain native plant species diversity within the upland plant community around the Afterbay.

The height, density, and moisture content of waterfowl nesting cover are strongly correlated with spring precipitation and fertilization. Low precipitation during February, March, and April are unlikely produce the same level of nesting density as above normal precipitation in these months.

### **6.0 Design Considerations and Evaluations:**

- Avoidance of sensitive resources including wetlands, vernal pools, and swales
- Avoidance of high recreation use areas
- Dry enough for fall/winter equipment use during disking and planting
- Soil suitability
- Site accessibility
- Proximity to adequate brooding habitat
- Greater nest densities documented on hill or slope as compared with level ground
- Minimize impact to previously undisturbed upland habitats which harbor higher densities of upland native plant species
- Minimize impacts to current or future land use, operations, or maintenance

#### **6.1 Environmental Permitting**

- Wildlife management activities on designated wildlife management areas are categorically exempt under CEQA.
- No Clean Water Act 404/401 permit is required if impacts to vernal pools, vernal swales, water quality, and other wetlands are avoided.
- Agricultural activities are not regulated under the Regional Water Quality Control Board's stormwater permit process.

#### **6.2 Threatened and Endangered Species**

Several State or federal species of concern may utilize the cover enhancements for nesting including northern harrier, short-eared owl, and American bittern. Further, these cover enhancements can provide foraging habitat for a variety of State and federal

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species of concern including northern harrier, short-eared owl, American bittern, prairie falcon, white-tailed kite, black-crowned night heron, Cooper's hawk, long-eared owl, merlin, and sharp-shinned hawk.

### **6.3 Previous Results**

Data collection over the last 15 years indicate that nest cover enhancements generally result in waterfowl nest densities of 3 to 10 nest/acre (Dr. Anthrop pers. comm.)

### **6.4 Additional Operations and Maintenance**

Assuming that DWR would provide funding to DFG to implement this Resource Action, no additional DWR Operations and Maintenance will be required beyond funding.

### **6.5 Evaluation and Monitoring**

Previous monitoring indicates that not all waterfowl nest cover plots are equally productive. Some monitoring for adaptive management should be considered.

### **6.6 Closely Related Resource Actions**

This Resource Action is closely associated with two potential Resource Actions (EWG-56 – Construction of Additional Waterfowl Brood Ponds and EWG-68A – Recharge of Waterfowl Brood Ponds). All three potential Resource Actions work together to minimize the potential adverse impacts associated with Afterbay water level fluctuations on waterfowl survival and production.

EWG-57A provides a mechanism to insure maintenance of existing brooding habitat while EWG-68A identifies opportunities for additional waterfowl brood ponds.

### **7.0 Synergism and Conflicts:**

The goal of this Resource Action is to (in coordination with EWG-56 and 68A) improve waterfowl nesting, production, and survival. Although incremental benefits can be provided through implementation of any of the three potential Resource Actions, they will be most effective if implemented as a package. Waterfowl nest cover enhancements will be most effective if implemented with close proximity to adequate brooding habitat. Together these three Resource Actions will minimize waterfowl losses during critical waterfowl life stages.

### **8.0 Uncertainties:**

Over the last 15 years waterfowl nest cover enhancement has proven an effective method to significantly increase waterfowl nest production and may also increase nestling survival.

### **9.0 Cost Estimates:**

Based on current costs 60 acres of nest cover enhancement (disking, seeding, and fertilization) would cost approximately \$9,600 per year, while annual fertilization costs on the remaining 180 acres would cost approximately \$5,400 per year.

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**10.0 Recommendations:**

Waterfowl nest cover enhancement are an effective, documented method to mitigate nesting habitat losses associated with regular spring inundation of the wetland margin of the Thermalito Afterbay resulting in increased waterfowl survival and production. Further, the nesting cover enhancements provide plant species and structural habitat diversity within the Thermalito portion of the OWA resulting in increased wildlife species diversity benefiting a wide range of wildlife species including several special status species.

**11.0 Literature Cited**

Dr. Don Anthrop personnel communication April 2003